

Secured E-Learning And Assessment Web-Based Application With Parental Control

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Abstract - COVID-19 outbreak triggered many schools, colleges & other educational institute to adopt electronic learning systems. This electronic-learning application can be very helpful for both learners as well as educators with an effective and real time environment. Through e-learning web apps, pupils' academic progress is improved. It has overcome limitation of time & venue and also made it possible for student fraternity, educators & parents of the students to be in continuous touch with each other's from any corner of the globe.

Online education established a very good foundation for transformation with the arrival of e-learning web application. As a result, many online learning systems have been developed.

For the use of e-Learning in elementary and secondary schools, a special control mechanism and instructions are needed. It is believed that a controlled education during adolescence shapes a person.

Keywords: E-learning, Parental controls, assessment platform, two factor authentication, secure web app.

1. INTRODUCTION

In today's technologically advanced world, where student populations are constantly increasing along with the number of departments in educational institutions, it is difficult for students and professors to exchange study materials.

E-learning's objective is to help students transcend beyond traditional classroom settings and get comfortable using the internet, where study materials for a variety of subjects are easily accessible. It provides a technique to have the online notes read automatically. The execution of this strategy benefits both the students and the teachers. Teachers can upload their notes to the website by logging in with their unique IDs, and students can access them by searching for the file name within the department they are a member of. The main goal of our project is to add parental controls and secure two-factor authentication to the web application to increase security and guarantee that user data is well safeguarded.

This technology makes it simpler for students to retrieve their notes while also helping institutions cut expenditures.

The amount of money that students and colleges spend on pointless printing expenses can be decreased.

1.1 E-learning platforms

Electronic learning environment has reached in different dimension from old classroom to new online learning system where pupils learn in "invisible classrooms". As a result of technological improvements and the cyberspace, colleges and universities are adjusting their teaching techniques to satisfy students expectations for an ideal learning environment. Through the use of e-learning strategies, it is possible to learn from electronically provided content via sending and receiving emails, participating in online forums and courses, holding video conferences, using CD-ROMs, and more (Cappel, Hayen 2004).

Universities and other higher education institutions have collaborated with many enterprises to create a virtual teaching and learning platform where many academic courses & certification programs were conducted through a consistent user interface. Many programs offered by colleges and universities, both on-campus and online, require students to attend some classes and orientations there. Nunamaker and others discussed that traditional classroom education is more expensive than online learning, and self-study independent study programs have various drawbacks from the perspective of the user. It is vital to watch and research these situations in order to pinpoint areas where the current design delivery methodologies need to be enhanced.

1.2 Parental controls

Technology has become a way of life today. The Internet is already easy to understand because it has the fastest connection speed. Young people's lives are also affected. Due to internet material, the negative effects that affect children, in particular, maybe more pronounced. As a result, parents should choose wisely for their children. Parents can prevent kids by harnessing the beauty of parental control features in one method by filtering, blocking, and monitoring online content. Particularly in Indonesia, studies were conducted to determine whether or not parental controls were helpful to parents. Utilizing the MAGIQ approach, effectiveness was measured as 0.365, productivity was 0.310, satisfaction was 0.191 & safety was measured as 0.133.

This study emphasizes the necessity to change parents' perspectives in order to support the effectiveness of parental control software and give parents the ability to assess, choose, and form opinions about the benefits and drawbacks of Internet access. The Indonesian government's online program for protecting children is known as Internet Sehat. However, occasionally it malfunctions as a result of the website administrator changing the domain, which gives the kids access once more. All over the internet, children have access to offensive material, including hate speech, cyberbullying, and perverse behavior.

1.3 Security

In order to preserve confidentiality your cloud data handheld device can be utilize because of to two-way authentication. One can log in to cloud account using their credentials in order to enable two-factor authentication. To complete login process mobile device will get OTP to finish login procedure.

Second step of two-way authentication tackle data privacy in two different manners First, unless they also have access to your mobile device, attempts by attackers to retrieve your cloud data online will be ineffective since they lack the last passphrase. Second, if an attempt is made to access your cloud data storage account, you will be notified. In the worst-case scenario, hackers could figure out the one-time phrase and access your data, but this is not very usual. Two-factor authentication will, however, at least notify you of the attack.

The OTP feature ensures that credentials that has been collected should not be utilize again, which helps to protect different kind of identification theft. Login of user name doesn't change frequently, on other hand password does change. This OTP is also termed as "one-time passcodes", are a reliable method of authentication that dramatically improves security for e-banking, business world & many more systems that deal with sensitive information and data.

Currently, many enterprises n/w, electronic commerce platforms, & many online societies only use name along with password (static in nature) to signup & get access of private sensitive data.

1.4 Advantages of E Learning Platforms

1. All students' needs are met through online education.

Online learning is the best method for everyone. The digital revolution has had a significant impact on content accessibility, consumption, discussion, and sharing. Online training classes are available for both office employees and stay-at-home mothers at times that are convenient for them. It depends upon their schedule and level of comfort that why many students, employees and other working professionals prefer to work or flexible days and timing over the week.

2. You can retake lectures as many as necessary. Unlike in a traditional classroom setting, online learning allows students unlimited access to the information. This is crucial throughout the exam preparation period of revision.

3. Enables access to recent material online learning offers various advantages but One valuable advantage of online mode is to keep professionals and students in sync with cutting edge technologies as well as trainers too. Now, professionals, student, and other people can have limitless access of fresh information.

4. Instruction is given promptly E-learning is a quick way to provide instruction. When compared to the traditional classroom instruction method, this mode offers relatively short delivery cycles.

5. Reduced Prices Compared to more traditional forms of education, e-learning is cheaper. The cost has decreased because learning occurs quickly and easily in this manner. Training time is considerably shortened in terms of teachers, travel, textbooks, and lodging.

6. Scalability, sixth the creation and dissemination of new theories, programs, and concepts are made easier through e-learning. Whether for formal education or for leisure, e-learning is a very quick means of learning!

7. Dependability Instructors can reach a larger audience and deliver the lesson more consistently by using e-learning. By doing this, it is ensured that all users of this learning mode receive uniform teaching. 8. Performance

The profitability of a company is positively impacted by e-learning. It makes the information simple to understand and process as: Higher certification, test, or other types of evaluation scores are the result, and a larger percentage of students complete the course successfully. enhanced capacity for learning and using new abilities or knowledge in the workplace; support for information retention for a longer duration.

1.5 Disadvantages of E Learning Platforms

1. Unreachable by others -

Consider yourself fortunate if you reside in a location with a swift and dependable internet connection. Unfortunately, some folks have very limited internet access. They find it quite annoying to have to use free Wi-Fi or go to internet cafes.

2. Lack of social interaction -

Because you can no longer interact in person with your teachers and fellow students, e-learning is one of the factors contributing to social isolation. There isn't much exchange of information.

3. requires self-drive and efficient time management skills -

When learners are enjoying freedom of online learning, they are alone. You should be inspired to work actively, take note of it, & get more take away points. To find out right balance among professional commitment and domestic duties, someone must possess good time management tactics.

4. Cheating is unstoppable -

Assessment in traditional classroom is very important and it is integral part teaching learning and same is also applicable with same degree with online learning too However, neither teachers nor invigilators are present to supervise you while you take tests. Online students find it simple to discuss solutions because they are conscious that no one is watching.

2. LITERATURE REVIEW

The study is broken down into four major sections, namely:

1. Phase of analysing the e-Learning environment. This stage explores the effects that eLearning can have on a high school setting.
2. Interaction in an e-learning model analysis. The necessity for literacy study and a field study that examines the relationship between students, teachers, and parents is covered in this phase.
3. The building of model's phase. In this stage, a general model for the parental control mechanism in online learning is built. This design is known as the parental control design (PCM).
4. Phase of model evaluation. By creating prototypes of the models and testing them with parents, this phase examines and confirms the outcomes of the model development phase.

E-learning, often known as electronic learning, is becoming more popular in education across the globe. The accessibility of handheld devices and web-based technologies played unprecedented role on viability of online learners' life. The world wide web & network enabling technologies offer a great platform for e-learning experiment & conversion of old teaching methodologies into cutting-edge holistic learning platform. Today's high-end electronic devices and www have significantly increased their value in education sector during recent past. To uplift online learning, it is important to harness these technologies & artefacts successfully, effectively, & with good quality it should be carefully designed & deployed by adopting well defined scientific practices & techniques.

Facilities for distance learning and education offer a variety of educational possibilities and have long been acknowledged as a tool to assist those who might otherwise be prevented from accessing knowledge and education. As information technology (IT) has developed and become

more widely used, particularly cyberspace, there have been chances to modernise remote online learning practices into an advance and next degree online learning platform. In-person and online learning using various technologies may have several potential benefits viz. extending availability of online learning and training, minimizing education expenses.

3. PROBLEM STATEMENT

Faculty members and students frequently lament the lack of variety in their courses. Ambrose, Bridges, DiPietro, Lovett, and Norman (2010) advise college professors to devote time, effort, and creativity to their courses in order to foster a more engaging learning environment. Making course assignments that are based on practical applications is one way to do this. Nilson (2010) asserts that case studies provide students with an alternate form of homework that frequently more successfully keeps their attention due to its realism, relevance, and (when done well) direct relation to course objectives. When given the opportunity to learn using case-based instructional approaches, students exhibit excellent performance and show a genuine interest in the course subject.

Studies show that using online tests allowed for more active learning activities in the classroom, such as role plays, discussions, in-class writing, and other small group activities. Despite the absence of a control group for comparison, the instructor thought that student engagement significantly increased, particularly when it came to discussing the required readings. Compared to previous class sections without online quizzes, there seems to be a better degree of involvement, as well as more in-depth comments and knowledgeable opinions. The instructor's enthusiasm for the session might have grown as a result of the reported increase in involvement, which would have enhanced the environment in the room as a whole.

It is simple to reuse the quiz materials once a teacher has produced and uploaded online tests relevant to the required course readings. With a small investment of time and money, the online examinations and prescribed readings can easily be updated or adjusted as needed. It would appear that the time spent initially setting up the online quizzes was well worth it if it meant that students would actually come to class prepared to discuss a reading assignment, participate more actively in group projects, be better prepared for class and exams, and have more time for active learning activities.

4. IMPLEMENTATION

A worldwide shift to an online learning environment was challenging in many respects, but it also revealed many advantages. Among them are:

1. Flexibility: With eLearning, you are not constrained to a specific classroom, neighborhood, or even nation. You can simply combine work and study.

2. Learning at your own pace: sign in whenever it's convenient for you. To easily fill in any gaps, you can easily refer back to earlier lectures, procedures, or lessons.

Time-efficiency: According to Brandon Hall, students typically invest 40–60% less time in eLearning than they do in traditional classroom settings.

Control over studies: According to IBM, students who take online courses may acquire five times more material than those who take traditional classes since they can learn at their own pace.

High retention rates: It can be difficult to keep a student interested in a course from beginning to end. However, online learning has really improved retention rate of student to a significant level i.e., 25 to 62%, as compared to retention rates of 8 to 12% with traditional method, claims an American research institute.

4.1 User interface

The top priority was to complete the tech stack we were going to employ and develop a user interface for the website. We decided to use basic html and CSS is used for front end and PHP along with node.js is used for back end.

We are testing our modifications in real time with a live server and VS-code as the code editor. Additionally, Xampp will be used to run MySql Server for the database. We'll utilize a preexisting component library, such as Bootstrap or Material You, to create the user interface.

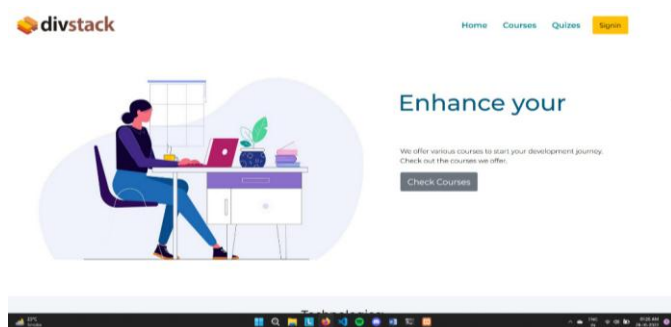


Fig -1: Landing page for e-learning project

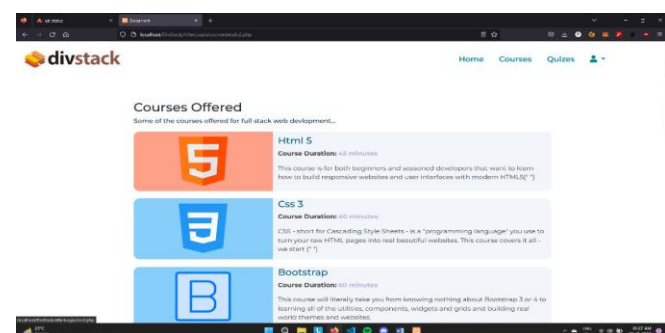


Fig -2: Various courses offered by our project

4.2 Back end

We are utilizing node.js for the backend portion along with various open-source libraries to build 2FA and Vonage Nexmo for SMS-based parental control reminders.

4.3 Software and Hardware Requirements

As the project was partially implemented on different machines and thus eventually combined on a different machine the set of Hardware varies and is combined to be depicted as shown below:

Hardware Details

1. Windows 8 or later
2. Processor: Intel Core i5 or equivalent.
3. Memory: 4 GB (64-bit)

Software Details

4. Software details -
5. PHP
6. VScode
7. SQL
8. Xampp
9. Bootstrap

4.4 Main Steps

1. The user fills out his registration or login details.
2. The user is presented with a home screen with a navbar, allowing them to peruse a number of options.
3. A section of the course that allows customers to watch topic-by-topic videos on each subject at their own pace.
4. A section with a quiz in which users can test their knowledge and get a thorough evaluation based on their answers.
5. If a student doesn't log into our program for more than 24 hours, parental controls send an SMS to the parent's mobile device.

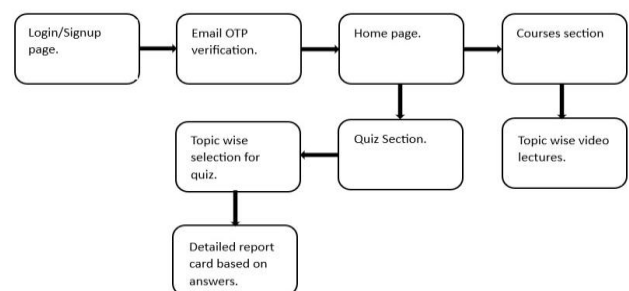


Fig -3: Flow Diagram of the project

5. CONCLUSIONS

Even the busiest individual can advance their profession and acquire new credentials thanks to e-learning, which gives students the flexibility to fit learning around their schedules. Since the introduction of the internet, several of the most significant advancements in education have occurred.

Nowadays students are accustomed to utilizing smart phones for chatting and the internet, so taking part in and managing an online program has become a straightforward process. It simply takes a holistic e-learning tool for education to be easily accessed from anywhere now that affordable e-learning solutions for PCs and the internet are available.

It would also be helpful to further document parents' roles and responsibilities and the way in which they engage in their child's online educational experience if there was evidence of student engagement with both the student's parent and teacher, the nature of the interaction, and other variables that might be accumulated through observational data of the online learning experience. Because there are passwords that can be easily guessed, the conventional method for authenticating a user on the Internet offers only a minimal level of security. Even if an attacker manages to bypass the first authentication step, using 2FA prevents illegal access because it adds a second layer of protection.

After concluding the research and implementing the project using Php, Mysql and Nodejs technologies, we are satisfied with the output of our application. Some of the future work scopes might include admin login system, live classes for students and teachers to interact in real time, and a chat system so that students and teachers could connect directly for doubt solving sessions.

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